

NATIONAL DOUBLE ELIMINATION - 2

TOSS-UP

1. **ASTR; Multiple Choice:** Recent measurements by the Hipparcos satellite place the Andromeda galaxy further than previously believed. The new estimate for the distance from the Sun to the Andromeda galaxy is approximately

(W) 880,000 parsecs.
(X) 335,000 light years.
(Y) 1.94 million light years.
(Z) 2.93 million light years.

ANSWER: Z-- 2.93 MILLION LIGHT YEARS

BONUS

1. **ASTR; Multiple Choice:** The distance from the Sun to the center of our Milky Way galaxy is about

(W) 1.3 million Astronomical Units.
(X) 1,200 parsecs.
(Y) 8,600 parsecs.
(Z) 105,000 light years.

ANSWER: Y-- 8,600 PARSECS

TOSS-UP

2. **BIOL; Multiple Choice:** In the mouth, starches in a cracker are broken down into sugars by the enzyme salivary

(W) trypsin.
(X) amylase.
(Y) lipase.
(Z) lactose.

ANSWER: X-- AMYLASE

BONUS

2. **BIOL; Multiple Choice:** After several hours, the partially digested food in the stomach

(W) prevents peristalsis.
(X) closes the pyloric valve.
(Y) becomes a bolus.
(Z) becomes chyme.

ANSWER: Z-- BECOMES CHYME

TOSS-UP

3. **PHYS; Multiple Choice:** When a car moves at constant velocity, the

(W) wheels are balanced.
(X) frictional force is greater than the engine's force.
(Y) engine's force is greater than the frictional force.
(Z) engine's force is equal to the frictional force.

ANSWER: Y-- ENGINE'S FORCE IS GREATER THAN THE FRICTIONAL FORCE

BONUS

3. **PHYS; Multiple Choice:** The work input of a crowbar is equal to the

(W) force applied to the handle.
(X) distance the handle moves.
(Y) force applied to the handle times the distance the handle moves.
(Z) force applied by the resistance times the distance through which this force is applied.

**ANSWER: Y-- FORCE APPLIED TO THE HANDLE TIMES THE DISTANCE
THE HANDLE MOVES**

TOSS-UP

4. **CHEM; Multiple Choice:** The molal freezing point constant

(W) varies with temperature and pressure.
(X) has the same value as the boiling point constant.
(Y) is independent of the solute used in making the solution.
(Z) is a function of a solute on a given solvent.

ANSWER: Z-- IS A FUNCTION OF A SOLUTE ON A GIVEN SOLVENT

BONUS

4. **CHEM; Multiple Choice:** To determine the concentration of a solution in molarity units, you need to know all of the following except

(W) mass of solute.
(X) mass of solvent.
(Y) total volume of solution.
(Z) chemical formula of solute.

ANSWER: X-- MASS OF SOLVENT

TOSS-UP

5. **GENR; Multiple Choice:** For non-industrial purposes, solar energy at the present time is most practical for

(W) generating electricity
(X) heating water
(Y) driving automobiles
(Z) running machinery

ANSWER: X-- HEATING WATER

BONUS

5. **GENR; Multiple Choice:** Which of the following is true of biomass energy?

(W) It is formed through photosynthesis.
(X) It is caused by heat due to the large mass of the earth.
(Y) It has been used for only a few years.
(Z) It is effective in only certain regions of the United States.

ANSWER: W-- IT IS FORMED THROUGH PHOTOSYNTHESIS

TOSS-UP

6. **COMP; Multiple Choice:** What type of display screens permit the computer to manipulate pixels on the screen individually rather than as blocks?

(W) Bitmapped
(X) Active mapped
(Y) SVGA
(Z) Character-mapped

ANSWER: W-- BITMAPPED

BONUS

6. **COMP; Multiple Choice:** Which of the following monitors has the highest resolution?

(W) VGA
(X) SVGA
(Y) EGA
(Z) XGA

ANSWER: Z-- XGA

TOSS-UP

7. CHEM; Multiple Choice: Compared to the pure solvent, the boiling point of a solution is

- (W) increased because of the lowered vapor pressure of the solution.**
- (X) increased because the solution has a higher osmotic pressure.**
- (Y) decreased because the solute boils at a higher temperature than the solvent.**
- (Z) decreased because the dissolved solute raises the vapor pressure of the solution over that of the solvent.**

ANSWER: W-- INCREASED BECAUSE OF THE LOWERED VAPOR PRESSURE OF THE SOLUTION

BONUS

7. CHEM; Multiple Choice: Which of the following is not an important factor influencing solubility?

- (W) Chemical nature of solute**
- (X) Temperature**
- (Y) Chemical nature of solvent**
- (Z) Volume of solvent**

ANSWER: Z-- VOLUME OF SOLVENT

TOSS-UP

8. BIOL; Multiple Choice: By the time food leaves the small intestine, it contains virtually no

- (W) cellulose.**
- (X) water.**
- (Y) undigestible substances.**
- (Z) nutrients.**

ANSWER: Z-- NUTRIENTS

BONUS

8. BIOL; Multiple Choice: The sodium carbonate that neutralizes the hydrochloric acid of the stomach is produced by the

- (W) gall bladder.**
- (X) pancreas.**
- (Y) small intestine.**
- (Z) diaphragm.**

ANSWER: X-- PANCREAS

TOSS-UP

9. PHYS; Multiple Choice: A ramp is a simple machine called the

- (W) wedge.
- (X) inclined plane.
- (Y) pulley.
- (Z) lever.

ANSWER: X-- INCLINED PLANE

BONUS

9. PHYS; Multiple Choice: Sharpening a wedge

- (W) decreases the mechanical advantage.
- (X) increases the effort force.
- (Y) decreases the mechanical advantage and increases the effort force.
- (Z) increases the mechanical advantage and decreases the effort force.

ANSWER: Z-- INCREASES THE MECHANICAL ADVANTAGE AND DECREASES THE EFFORT FORCE

TOSS-UP

10. ERSC; Multiple Choice: A classification of metamorphic rocks would include whether they are

- (W) chemical or organic.
- (X) intrusive or extrusive.
- (Y) foliated or nonfoliated.
- (Z) basaltic or granitic.

ANSWER: Y-- FOLIATED OR NONFOLIATED

BONUS

10. ERSC; Multiple Choice: A detrital rock is named according to

- (W) its age.
- (X) the size and shape of its sediments.
- (Y) its location.
- (Z) the color of its sediments.

ANSWER: X-- THE SIZE AND SHAPE OF ITS SEDIMENTS

TOSS-UP

11. BIOL; Multiple Choice: The term “essential amino acids” refers to the

- (W) 20 amino acids the body needs.**
- (X) 12 amino acids the body manufactures.**
- (Y) 8 amino acids obtained only from the diet.**
- (Z) amino acids used to synthesize protein**

ANSWER: Y-- 8 AMINO ACIDS OBTAINED ONLY FROM THE DIET

BONUS

11. BIOL; Multiple Choice: Some bacteria in the colon manufacture

- (W) peptidases.**
- (X) vitamin K.**
- (Y) trace elements.**
- (Z) essential amino acids.**

ANSWER: X-- VITAMIN K

TOSS-UP

12. PHYS; Multiple Choice: The number of times a machine multiplies effort force is

- (W) momentum of the machine.**
- (X) mechanical advantage.**
- (Y) power of the machine.**
- (Z) resistance of the machine.**

ANSWER: X-- MECHANICAL ADVANTAGE

BONUS

12. PHYS; Multiple Choice: The efficiency of a machine can be increased by reducing

- (W) effort force.**
- (X) resistance force.**
- (Y) the distance through which effort force is applied.**
- (Z) friction.**

ANSWER: Z-- FRICTION

TOSS-UP

13. CHEM; Multiple Choice: Which of the following's solubility is most affected by pressure?

- (W) Ionic solids
- (X) Supersaturated solutions
- (Y) Gases
- (Z) Alloys

ANSWER: Y-- GASES

BONUS

13. CHEM; Multiple Choice: Colligative properties of solutions depend on the

- (W) chemical nature of the solute.
- (X) concentration of solute molecules dissolved.
- (Y) physical nature of the solute.
- (Z) number of moles of solvent.

ANSWER: X-- CONCENTRATION OF SOLUTE MOLECULES DISSOLVED

TOSS-UP

14. MATH; Multiple Choice: What type of numbers are included in the real number line that are not included in the rational number line?

- (W) whole numbers
- (X) integers
- (Y) irrational numbers
- (Z) fractional numbers

ANSWER: Y-- IRRATIONAL NUMBERS

BONUS

14. MATH; Multiple Choice: What is the length of the body diagonal of a cube with each edge equal to 1?

- (W) square root of 2
- (X) square root of 3
- (Y) 1
- (Z) 2

ANSWER: X-- SQUARE ROOT OF 3

TOSS-UP

15. **GENR; Multiple Choice:** In the United States, coal is the energy source that produces the highest percentage of our electricity. What energy source produces the second highest percentage?

(W) hydropower
(X) oil
(Y) nuclear energy
(Z) solar energy

ANSWER: Y-- NUCLEAR ENERGY

BONUS

15. **GENR; Multiple Choice:** Which of the following radioactive elements is most commonly detected in humans?

(W) potassium-40
(X) cobalt-60
(Y) iodine-131
(Z) plutonium-238

ANSWER: W-- POTASSIUM-40

TOSS-UP

16. **BIOL; Multiple Choice:** The total capacity of the lungs is about one liter

(W) less than the vital capacity.
(X) more than the vital capacity.
(Y) less than the tracheal capacity.
(Z) more than the tracheal capacity.

ANSWER: X-- MORE THAN THE VITAL CAPACITY

BONUS

16. **BIOL; Multiple Choice:** During normal breathing, the volume of air we exchange is only about

(W) 0.1 liter.
(X) 0.5 liter.
(Y) 2.5 liters.
(Z) 4.0 liters.

ANSWER: X-- 0.5 LITER

TOSS-UP

17. ASTR; Multiple Choice: The annual Perseid meteor shower is associated with

- (W) a swarm of dust from the comet Swift-Tuttle.
- (X) the annual return of periodic comet Enke [pronounce N-kee].
- (Y) debris from the collisions of meteors with the moon.
- (Z) gravitational perturbation of asteroid fragments by the planet Jupiter.

ANSWER: W-- A SWARM OF DUST FROM THE COMET SWIFT-TUTTLE

BONUS

17. ASTR; Multiple Choice: The most likely source of long period comets such as Comet Hale-Bopp is

- (W) The Oort cloud [pronounce ORT].
- (X) The Kuiper Belt [pronounce KYE-per].
- (Y) Interstellar space.
- (Z) A Bok Globule.

ANSWER: W-- THE OORT CLOUD

TOSS-UP

18. PHYS; Multiple Choice: When an inclined plane is used,

- (W) a greater force is exerted over a shorter distance.
- (X) a smaller force is exerted over a longer distance.
- (Y) a mechanical advantage of less than one can result.
- (Z) the mechanical advantage increases as the height of the slope increases.

ANSWER: X-- A SMALLER FORCE IS EXERTED OVER A LONGER DISTANCE

BONUS

18. PHYS; Multiple Choice: If a machine has a mechanical advantage of one, it

- (W) multiplies effort.
- (X) reduces effort.
- (Y) multiplies resistance.
- (Z) may change the direction of the force.

ANSWER: Z-- MAY CHANGE THE DIRECTION OF THE FORCE

TOSS-UP

19. CHEM; Multiple Choice: Why can water dissolve NaCl, whereas hexane cannot?

- (W) Hexane is attracted to the sodium ions, but not to the chlorine atoms.
- (X) As a polar solvent, water is attracted to both anions and cations.
- (Y) Both water and salt are inorganic and hexane is organic.
- (Z) Water can form hydrogen bonds with NaCl.

ANSWER: X-- AS A POLAR SOLVENT, WATER IS ATTRACTED TO BOTH ANIONS AND CATIONS

BONUS

19. CHEM; Multiple Choice: One way to measure solution concentration is by mole fraction, which is expressed as

- (W) moles of solute/moles of solvent.
- (X) moles of component/total moles of solution.
- (Y) moles of solute A/moles of solute B.
- (Z) solute percent of total moles.

ANSWER: X-- MOLES OF COMPONENT/TOTAL MOLES OF SOLUTION

TOSS-UP

20. ERSC; Multiple Choice: The layer of soil that contains organisms and organic matter is called horizon

- (W) A
- (X) B
- (Y) C
- (Z) D

ANSWER: W-- A

BONUS

20. ERSC; Multiple Choice: Metamorphic rocks that show layers of dark minerals interspaced with layers of light materials are classified as

- (W) nonfoliated.
- (X) recrystallized.
- (Y) foliated.
- (Z) intrusive.

ANSWER: Y-- FOLIATED

TOSS-UP

- 21. COMP; Short Answer: What is the name of an add-on board that creates digital music?**

ANSWER: MIDI

BONUS

- 21. COMP; Multiple Choice: Which of the following is a compression technique that permanently discards some of the data during compression?**

(W) Full loss
(X) Lossless
(Y) Lossy
(Z) None of the above

ANSWER: Y-- LOSSY

TOSS-UP

- 22. BIOL; Short Answer: Gout is due to the build-up of what substance in the blood?**

ANSWER: URIC ACID

BONUS

- 22. BIOL; Multiple Choice: Compared with the walls of arteries, the walls of veins**

(W) are thicker.
(X) are more elastic.
(Y) lack valves.
(Z) have more resistance.

ANSWER: X-- ARE MORE ELASTIC

TOSS-UP

- 23. MATH; Short Answer: What is the value of the sine of 60 degrees divided by one half of the cosine of 30 degrees?**

ANSWER: 2

BONUS

- 23. MATH; Short Answer: Consider a cube that has an edge length of 3 centimeters. Find the cube's surface area in square centimeters.**

ANSWER: 54 SQUARE CENTIMETERS (ACCEPT 54)

TOSS-UP

- 24. PHYS; Short Answer: The area of thermodynamics concerned with the measuring the amount of heat is called what?**

ANSWER: CALORIMETRY

BONUS

- 24. PHYS; Multiple Choice: In a second-class lever, the**
- (W) fulcrum is between the effort force and resistance force.**
 - (X) effort force is between the resistance force and fulcrum.**
 - (Y) resistance force is between the effort force and fulcrum.**
 - (Z) none of these**

ANSWER: Y-- RESISTANCE FORCE IS BETWEEN THE EFFORT FORCE AND FULCRUM

TOSS-UP

25. CHEM; Short Answer: The elements of the 4f series are called

ANSWER: LANTHANIDES

BONUS

25. CHEM; Multiple Choice: All of the following are colligative properties except

- (W) chemical solubility.**
- (X) freezing point depression.**
- (Y) boiling point elevation.**
- (Z) vapor pressure reduction.**

ANSWER: W-- CHEMICAL SOLUBILITY